DOCUMENT RESUME

ED 388 756 CE 069 828

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TITLE Linking Schools and Workplaces: Lessons from Australia and Overseas.
PUB DATE Oct 95
NOTE 20p.; Paper presented at the National and International Convention of the Australian Institute of Training and Development (Port Douglas, Queensland, Australia, September 30-October 6, 1995).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Cooperative Programs; Educational Benefits; Educational Policy; *Educational Practices; Educational Strategies; Educational Trends; *Education Work Relationship; Foreign Countries; *Noncollege Bound Students; Outcomes of Education; Planning; Postsecondary Education; Program Effectiveness; Public Policy; *School Business Relationship; Secondary Education; Trend Analysis
IDENTIFIERS *Australia; *Sweden

ABSTRACT

Efforts to link schools and workplaces in Australia, Sweden, and elsewhere were examined to identify preconditions and effective strategies for linking school to work in Australia. An Australian program that combines applied, contextualized learning structured according to industry standards with students' general education was shown to produce graduates with higher rates of participation in postsecondary education and lower unemployment rates than nonuniversity-bound completers of other secondary education programs. The relative ease with which Japanese and German students make the transition from school to work was attributed to three factors: employers value academic skills and invest in efforts to develop them; work-bound students exert effort because school performance is relevant to their future careers; and teachers have authority to give students access to jobs and to give employers dependable student evaluations. Special attention was paid to the operation and effectiveness of Sweden's new system of upper secondary education, which is based on an implicit partnership between employers and the state and which views enterprises and schools as co-educators and divides the curriculum between workplaces and schools. Links between schools and business were found to be strong in some industries such as construction and wood technology but weak in others, and resourcing was identified as a continuing problem. (Contains 11 references.) (MN)

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Linking schools and workplaces: Lessons from Australia and overseas

Richard Sweet
Dusseldorp Skills Forum

Australian Institute of Training and Development
National and International Convention

Port Douglas, October 1995

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Effective learning

Imagine a high school located at a plant of Email or Ford - offering a full Higher School Certificate or Victorian Certificate of Education qualification:

- With a program of studies that consists of roughly fifty per cent general education subjects - English, foreign languages, sport, humanities and social sciences, civics and the arts;

- With the other half consisting of technological and engineering studies - nationally accredited TAFE or ITAB subjects or modules in areas such as fluid power, robotics, and CAD-CAM as well as traditional engineering subjects - but in a pattern tailored to the types of technology and production processes typically found in Email or Ford, rather than being absolutely identical to TAFE technician level Diploma courses in engineering;

- And requiring fifteen per cent of the total time over Years 11 and 12 to be spent learning in the workplace, with this time being part of the curriculum, not just work experience.

Sixty per cent of all Swedish senior students are in programs such as this, although few are in the type of institutional arrangement that I have outlined. I went to three such industrial high schools in Sweden in February this year, as well as to a larger number of more traditional Swedish upper secondary schools. They were:

- At Volvo, where the teachers were employed by the firm and where the funds came from the public education system under the equivalent of a voucher system for the delivery of the national senior secondary qualification;

- At SAAB-Scania, where the teachers were employed and paid by the firm out of its own resources to deliver the national senior secondary qualification;

- And at ASEA-Brown-Boveri, where the teachers were both employed and paid by the education system to deliver the national senior secondary qualification.

At ASEA-Brown-Boveri's industrial high school I asked the physics teacher who was the Deputy Principal why he was working in this new, experimental type of school, and why he had chosen to leave a traditional, large, senior secondary school. His answer had nothing to with his views on vocational education. He said that it was because "I have always wanted to start teaching physics from the experiment, not the theory." A greenfield site gave him the opportunity to innovate, but even more importantly, the location of the school directly within the grounds of an advanced electrical engineering firm gave his students multiple opportunities to observe physics in action, to build an understanding of physical principles from seeing them in application.

I don't know whether he had read Lauren Resnick's 1987 presidential address to the American Educational Research Association "Learning In School And Out", although I met a number of educators in Sweden who had, but in essence he was asserting her rediscovery of the virtues of induction over deduction, and her reassertion of many of the lessons that Dewey had espoused years previously. In effect what both were saying is that we can profitably invert the traditional relationship between theory and practice, between concept and experience, between the classroom and the world outside it to provide students with rich and powerful learning - with a high quality, broad education that has both general and vocational elements inextricably intertwined, including learning from the world outside the confines of the classroom as well as from within it.

In part of her 1987 paper Resnick looks at the features (set out in Exhibit 1) that characterise school programs that are effective in teaching students to think and to solve problems, and points out how much they have in common with the learning processes that typify apprenticeship: going from the particular to the general, setting learning in context so that understanding grows, building competence a step at a time. The educational benefits of this type of learning - the rediscovery of the best features of apprenticeship within general education - is now a common theme in a lot of educational writing within the United States. For example it can be seen in the work of David Stern of the National Center for Research on Vocational Education at Berkeley, and in the work of Cathy Stasz of the Rand Corporation.

Exhibit 1: Features of school programs that teach problem solving and learning how to learn

- Involve socially shared intellectual work
- Are organised around joint accomplishment of tasks, so that elements of a skill take on meaning in the context of the whole
- Allow competence to build step by step
- Make usually hidden processes overt
- Encourage student observation and commentary
- Are organised around **particular** bodies of knowledge rather than **general** abilities and concepts

These are features that also commonly characterise:

- Out-of-school cognitive performance
- Apprenticeship

Source: Resnick, 1987

In a seminar in Sydney in March this year Lauren Resnick described the types of school organisation that can promote independent, problem solving learning styles (see Exhibit 2). Again, we see an emphasis upon shared learning and upon learning in context.

But we do not need to look overseas to learn how powerfully motivating contextualised, applied learning can be, or how effective it is in developing key competencies for life and work. In a recent study for the Tasmanian Department of Education and the Arts of the learning practices in the TRAC program - in which students enrolled in an industry-accredited vocational course spend a day a week in the workplace as well as in the classroom - Robyn Scharaschkin characterises the difference between traditional classroom learning and TRAC learning styles (see Exhibit 3) in a way that has many parallels to the types of learning

that Resnick describes: engaged rather than detached learning; immediate rather than delayed feedback; a learning environment with adult rather than youth behavioural norms.

Exhibit 2: Features of schools that teach problem solving and learning how to learn

Today's Schools	Tomorrow's Schools
■ Focus on the development of basic skills	■ Focus on the development of thinking skills
■ Testing separate from teaching	■ Assessment integrated with teaching
■ Students work as individuals	■ Students work as teams
■ Hierarchically sequenced basics before higher order knowledge	■ Skills learned in context of real problems
■ Supervision by administration	■ Learner-centred; teacher directed
■ Elite students learn to think	■ All students learn to think

Source: Lauren Resnick NIEF seminar, Sydney, March 1995

The benefits to the students of this type of learning environment, set out in Exhibit 4, Sharashkin points out, span the cognitive, personal, social and occupational domains.

Scharaschkin found that this learning mode resulted in students acquiring knowledge, skills and attributes that:

- Were both generic and specific;
- Derived from both reflection and action;
- Integrate theory and practice; and
- Are of both enduring and immediate value.

Exhibit 3: Features of classroom and workplace learning sites

Contrasting Student Workplaces:	
Traditional classroom	**TRAC**
■ Single learning site	■ Multiple learning sites
■ Detached learning settings	■ Engaged learning settings
■ Routinised times, hours	■ Flexible, dynamic times
■ Young person peer norms	■ Adult work ethos
■ Intangible rewards	■ Tangible rewards
■ Delayed feedback	■ Immediate feedback
■ Limited consequences	■ Authentic consequences

Source: Scharaschkin 1995

We are seeing here a powerful form of learning, one that has significant cognitive, personal development and general educational benefits and which at the same time, Scharashkin suggests, confers significant career development benefits.

At the Dusseldorp Skills Forum we have come to similar conclusions about the employment and career benefits of this type of learning in the five years or so that we have been monitoring the outcomes of the TRAC program. The lesson was repeated most recently in a national follow up of some 500 students who completed TRAC last year. The solid nature of the pathways that are built by combining applied, contextualised learning structured according to industry standards with students' general education is demonstrated by statistics on the young peoples' employment and education outcomes, shown in Figures 1 and 2. They had an unemployment rate roughly half that of non-university bound school leavers as a whole, and were roughly fifty per cent more

likely than non-university bound school leavers to be taking part in further education and training through TAFE, apprenticeships, traineeships and the like.

Exhibit 4: Student benefits from the TRAC program

TRAC Students Were Seen To Have:	
■ Become more motivated and confident	■ Increased their personal and practical skills
■ Interacted more effectively with others	■ Broadened their knowledge
■ Become happier at college	■ Learned to better manage time and themselves
■ Gained an idea of a career pathway	■ Improved their behaviour
■ Increased their employability	

Source: Scharaschkin 1995

Their comments closely reflected the responses of the students in Scharashkin's Tasmanian study. Not only did they see that the program built strong links for them into post school employment and training. They also commented repeatedly on the ways in which it had increased their confidence and self esteem, as well as giving them valuable employment skills. It was also interesting to note their comments on the ways in which TRAC had helped them to enter employment. As well as appreciating the skills that they had gained and the way in which it had boosted their confidence, students commented upon the importance of a detailed transcript of the skills that they had gained in convincing employers to hire them, and on how important it was that they had gained some close and direct contacts with employers in their local labour market through participating in the program. This theme - the importance of building links between schools and their local labour market - will be developed in the following sections of the paper, initially through some overseas evidence.

Figure 1: Education and training outcomes for TRAC graduates

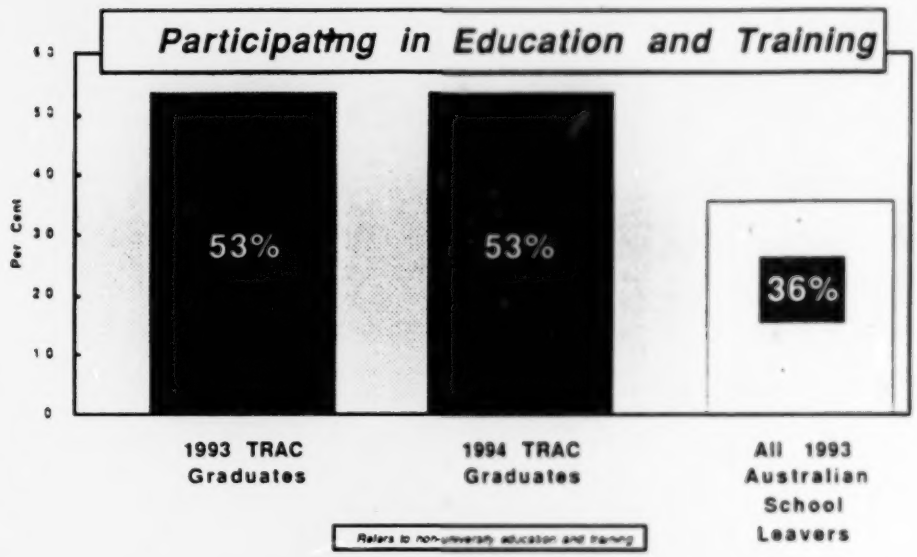
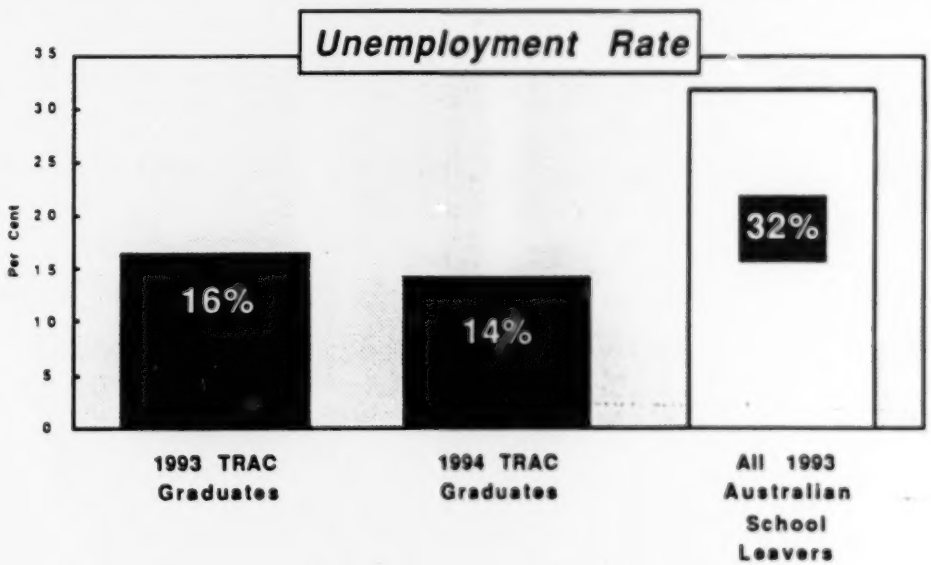


Figure 2: Labour market outcomes for TRAC graduates



Sources: 1994 and 1995 national TRAC follow up surveys and ABS *Transition from Education to Work*, Cat. No. 6227.0.

Preconditions for effective school-to-work transitions

How can opportunities for students to benefit from this powerful applied, contextualised education be maximised, whilst at the same time building strong school-to-work pathways? The messages from four countries appear to be remarkably similar. Let me introduce them by describing a paper given at an OECD roundtable meeting on the transition from school-to-work that I attended in February.

The paper was given by James Rosenbaum of North Western University in Chicago, who began by contrasting the apparent ease and effectiveness of transition arrangements for non-university bound Japanese high school graduates with those of comparable students in the United States. Drawing upon work that he has done with Takehiko Kariya from the University of Tokyo, who was also present at the meeting, and upon lessons from Germany which also appears to have effective and smooth transition arrangements for youth, Rosenbaum pointed to the strong connections that exist in Japan and Germany between schools, the individual teachers in them, and Japanese firms. From this, he sets out three preconditions for effective school to work linkages.

These are:

- Employers value academic skills, and they invest in efforts to get them;
- Work-bound students exert effort because school performance is relevant to their future careers; and
- Teachers have authority to give students access to jobs and to give employers dependable student evaluations.

These features, says Rosenbaum, are not like the traditional systems- , bureaucratic- and managerialist-centred approaches to the study of the transition from school. Rather than looking at educational structures, curriculum, credentials and financing, it is an approach that looks at the nature of the personal relationships between and expectations of the key actors: the students; the teachers; and the employers. Things go well for young people, says Rosenbaum, when all three have a common set of shared expectations about how each should behave, and when each

behaves according to these expectations. Students will work hard if they know that employers will give them a job if their results are favourable; employers will hire school students if they think that they have the qualities that they want and that the school has assessed these fairly; and both students and employers will respect teachers if what they do can genuinely make a difference to the students' chances of getting a job.

Rosenbaum's research looks at the extent to which these features of effective school-to-work transition arrangements can be found in the United States, despite an overall set of arrangements that do not appear to be effective for non-college bound youth. He finds that, indeed, it is possible to find effective arrangements within a system that in overall terms is less than effective. And he finds that this is a function of arrangements that are built up at a local level. Individual schools and individual firms, at the local level, are able to put in place transition arrangements for young people that are reliable, effective, and which rely upon each of the key parties having common and shared expectations.

Schools and their communities working together can build better transition arrangements, says Rosenbaum, even if the overall system does not support these. Of course, his paper implies, things could be even more effective for even more students if the overall system and local arrangements were harmonised, as in Japan. Then we would not have to rely upon the often transient enthusiasms of local devotees who too frequently become burned out from being at the cutting edge for too long without adequate support.

In the paper that he presented at the same OECD meeting, Kariya reinforced the importance of close personal links between firms and schools in the effectiveness of Japanese transition arrangements for non-college bound school leavers. The more long term and stable these relationships between firms and teachers in particular schools are, the easier and more dependable is the transition from school to work for young people. Firms get to know and to trust the schools, students tailor their efforts and expectations according to those of the firms that are closely linked to the school, firms trust the grades that teachers give to students, and accordingly give the students jobs.

Schools and workplaces: Lessons from Sweden

Shortly after the OECD meeting in February I spent some time in Sweden looking at their new arrangements for upper secondary education. Legislation passed by the Swedish Parliament in 1991 signalled a major reorganisation of upper secondary education. The legislation introduced sixteen broadly based national programs, all of three years duration, that were to become fully operational by 1995 after an initial trial period. Two of these programs - in the natural and social sciences - are intended to prepare students for higher education, and the remaining fourteen are vocationally oriented, although at the same time also conferring general eligibility for higher education entry. The majority of the new programs are structured around a broad common first year, with more specialised branches being available to students in later years. For example the transport technology program offers second and third year students specialisations in flight technology, body and coach work, vehicle technology and transport.

In addition to the sixteen national programs, schools are able to offer individual programs. These can be designed to suit local circumstances (for example the existence of a specialised local industry such as glass blowing or goldsmithing), and offered either as specialised branches within an existing national program or as a completely separate program. Individual programs can also be designed to suit the needs of particular students (for example those with special interests or those with poor academic skills). Apprenticeships, in which the young person is legally an employee of a firm rather than a student, can be offered as individual programs, provided that the core subjects of Swedish, English, civics, religious studies and mathematics are included. The industrial high schools that I mentioned at the beginning of this paper tend to run under these arrangements. Special bridging programs are also offered within the third year of some national vocational programs to allow students to reach the level of performance required by universities in subjects such as mathematics or physics within particular faculties such as engineering.

Swedish, English, mathematics, civics, religious education, general science, physical education and the arts are included as core

subjects in all programs, and account for roughly a third of the total time in the vocational programs. Approximately half of the total time in vocational programs is spent on vocational subjects that are specific to the industry or occupational group associated with the particular program. These subjects are meant to be organised in a flexible system of short courses or modules, with local authorities being required to develop their own local solutions as to how this might be done.

The new system of upper secondary education embodies a commitment to choice and diversity in a number of ways, one of which is the provision for individual programs already referred to. In addition, each of the national programs must, in addition to a compulsory core and obligatory vocational subjects, devote roughly fifteen per cent of the total time to a combination of individually chosen subjects such as a second foreign language, to local supplements or practical work related to subjects in the program, and to a special project of the student's choice. One of the most striking features of the new system is that the legislation that introduced it imposes an obligation upon schools and local authorities to attempt to provide all students with access to their first choice of program.

This requirement is even more striking in light of the further requirement that fifteen per cent of students' total time over the three years of a vocational program must be spent in structured learning in the work place, with the young people to be treated as students rather than as employees. Unlike the previous system, in which the workplace was largely seen as subsidiary to the school, as somewhere for students to practice what was learned in the classroom, workplace training is now intended to be "syllabus guided". It is to be treated as teaching and learning time, and structured and assessed accordingly, in order to strengthen the connection between school and working life. The school system now has to be able to guarantee the majority of its students access to high quality learning within a workplace for a substantial proportion of their three year program. In effect there is now an implicit partnership between employers and the State, with enterprises and schools to become co-educators of students, and with the curriculum to be divided between the two locations.

This, rather than any increase in the amount of time spent in the workplace, is the major difference between the new system and

previous arrangements. The school system now has to be able to guarantee the majority of its upper secondary students access to structured high quality learning within a workplace for a substantial proportion of their total three year program. A new relationship is now to be constructed between the school and the firm, with a more formal role for the workplace as a classroom in its own right. Yet the implicit obligation imposed upon school authorities to guarantee students quality access to workplaces exists in the absence of any reciprocal obligations upon employers. The implicit agreement contained within the 1991 legislation that firms would become co-educators of a high proportion of Sweden's youth, without any legal obligation for them to do so, was entered into by SAF, Sweden's peak employer body, both with an understanding of its implications for its members, and with an expectation that Swedish employers would be able to deliver.

The new Swedish system in practice

My interest in going to Sweden to look at the new system in operation arose very much because of the success of a number of similar pilot programs in Australia, both the TRAC program and many of the pilot programs under the Australian Vocational Training System. Many in Australia acknowledge the value of these programs. But others, as research by Jack Keating and Vic Zbar has shown, express doubts that they can be extended sufficiently widely to encompass a high proportion of the upper secondary cohort. Employers, they claim, will never come to the party in sufficient numbers to make new arrangements work for any but a few, so we might as well stick to the familiar and comfortable confines of classroom learning.

So it seemed very important to look closely at a country that has in effect promised all of its students in upper secondary vocational programs that they will have the opportunity to spend a significant proportion of their curriculum time in the workplace, being taught by workers and employers, and have this learning both included in final school certificates and recognised by industry for employment purposes.

Before arriving in Sweden I was unable to gain a clear picture of whether or not the new arrangements were working, and in particular of whether the partnership between the State and

industry implied by the 1991 legislation was able to deliver sufficient places for students. However my experience in five areas of Sweden - Västerås, Skövde, Karlstad, Södertälje and Stockholm - convinced me that it is possible for Australia realistically to plan to extend workplace learning arrangements to the point where they include a significant proportion of senior secondary students. In all of the areas that I visited the great majority of students had been able to have work placements arranged for them to meet curriculum requirements. There have been reports of difficulties being encountered in generating sufficient places, but this was not encountered as a major problem in any of the five centres that I visited. Nor was it, with only minor exceptions such as electrical engineering programs as a result of the current recession, a problem in the particular vocational programs that I studied within these regions. Even in an industry such as construction, which had been hard hit by economic recession at the time of my visit, all students in the construction program had been gaining work placements in each of the schools that I visited that offered it. Whilst many in Australia might be sceptical about the ability of the labour market to generate sufficient work placements to meet student demand, Sweden's experience suggests that this caution is misplaced. However it is important to appreciate that the Swedish system of workplace training for senior secondary students, or APU, works because of some particular features that are often but not always replicated in similar Australian programs.

The workplace training system appears to work as part of Swedish upper secondary education in part because employers take a long term view of their skill requirements, and in part because they do not have an alternative system such as apprenticeship to rely upon. But it works well mainly because of the close connections that exist at the local level between teachers, students and firms, and in this respect it has elements in common with Japan's school to work transition arrangements. I was struck by how frequently I was taken to firms by senior school administrators and by teachers who obviously knew the firms well and had close personal links both to the managers of the firms and to the individual workers and supervisors who carried out the workplace training. And it was clear that these relationships worked well and best when school principals had taken deliberate decisions to resource them by appointing full-time program coordinators to be responsible for overseeing the quality of the workplace learning and by giving

individual teachers release time to spend in the firms where their students were trained. The arrangements did not usually happen by accident, and were not normally imposed upon teachers as an additional and unrecognised part of their duties.

Equally important to the effectiveness of these arrangements for workplace learning is the degree of ownership that firms have over the training arrangements at the local level, and the control that they exercise over the establishment of standards and the assessment and reporting of performance. Unlike Australia, they are not bound to observe nationally consistent performance or assessment criteria, but may decide for themselves the basis upon which they judge a young person to be competent, even though the broad learning outcomes to be achieved must reflect the goals of the national curriculum. At the local level the schools treat the firms as if they, not the schools, are the best judges. The trust that schools place in them is a strong motivation for the firms to offer training places to the schools' students.

The close link that exists in many cases between training and recruitment is another important factor motivating firms to participate. They trust the students' skills because they have trained them according to their own standards and requirements, and as a consequence they offer the students jobs when they graduate from high school. All of this, it must be stressed, exists within the framework of a national curriculum and national certification arrangements.

Local committees or boards exist in many areas to support the workplace training arrangements, but these do not appear to be nearly as important as personal relationships between the key actors. Even employers that I met who were well disposed towards the relationships that they had with their schools did not see the local committees as an important mechanism, and many of the local committees appear to be dominated by schools rather than being real partnerships between schools and firms. However there are enormous variations from region to region, and indeed within schools, in these arrangements as in all other aspects of the implementation of the new programs.

Links between national industry bodies and local arrangements appeared to be effective in some industries such as construction and wood technology, but quite weak in others. In all areas and

industries, local arrangements to solve issues and problems seem to be the rule rather than the exception. Issues of consistency in assessment have not been resolved in all areas and industries, but where arrangements have been worked out to the satisfaction of both parties, the enterprise's judgement rather than the school's dictates sets the framework. Where individual enterprises cannot cover the full spectrum of knowledge and skill required by the curriculum rotation of the students between work sites is widely used to share the learning between enterprises. The schools also appear to exercise close quality control to ensure that adequate protective arrangements and adequate training skills are in place within individual firms. These are also matters that need to be resourced, and given the increasingly devolved nature of school funding in Sweden, they are matters over which principals have considerable discretion.

Nevertheless resourcing remains an unresolved issue, both in terms of teacher time and enterprise support and training. It was clear however that these issues appear to be resolved most readily in the medium term when schools had been provided with seed funding when programs began to allow them to address issues of implementation and quality control in conjunction with local employers, and to work out how to adjust their internal resource allocations accordingly in future years.

One measure of the effectiveness of the Swedish system in meeting industry skill standards and needs is the existence in some industry sectors, and within many individual enterprises, of agreed and industrially negotiated arrangements that relate students' achievements at the time of leaving school to specified pay scales and career ladders. This was particularly obvious in the construction industry, but it was also evident in the automotive repair industry, which accepts a student's high school graduation as evidence of skilled worker status and skills.

Lessons from Australia

I have dwelt at some length on arrangements in Sweden and elsewhere, but we do not need to go overseas to observe very similar messages. As is the case with the lessons on the educational benefits of workplace learning within upper secondary school, there is Australian research that provides valuable lessons

about the arrangements that make this work. In research on workplace learning in New South Wales senior secondary courses, Barbara Lepani and John Currie make it clear that employers take part for a variety of reasons, but that the existence of mutual benefits to the firm on the one hand and the student and the school on the other is a key to their success.

The authors point out that enterprises are highly concerned to help students' education by giving them the chance to develop vocational skills through practical experience, as well as by helping them to make more informed decisions about prospective careers. Many employers and their workers feel the lack of this type of learning in their own school education, and are keen to provide a form of education they would have wished to receive at school. In addition to improving the quality of students' learning, their skills and their career choices, many employers are strongly motivated to participate in such courses by a desire to give something back to the community.

Part of the reason that employers offer vocational placements to senior secondary students is that this can assist them in future recruitment decisions. It is also clear that employers recognise that such courses improve students' attitudes, values and maturity, their ability to apply knowledge, their future productivity, and their self-esteem and motivation. These results directly mirror findings from previous research by Barbara Lepani for the National Industry Education Forum which shows that these are the benefits that young people themselves value most highly from workplace learning. The findings provide a strong basis for partnership between schools and business enterprises, sharing some common aims and objectives as co-educators of young people. The parallels with Rosenbaum's paper for the OECD earlier this year and with current Swedish experience are striking.

But of equal significance, employers also take part because they see that such programs are of direct benefit to their staff. Employers clearly recognise that such programs improve the communication and supervision skills of their staff, they deepen their understanding of their jobs, they develop their staffs' training skills, and they enhance their motivation and their self-esteem. For many firms participation in such a program has represented their first step in becoming a learning organisation.

There are a number of specific features of such courses that enhance employers' involvement and commitment. All are aspects which enhance a genuine partnership between education and industry, rather than the type of one-sided relationship in which one makes use of the other for its own ends. Lepani and Currie found that the involvement of employers in real decisions about the delivery of the curriculum, the assessment of the learning, the management of the program and the selection of the student will all increase their commitment and enthusiasm and enhance the quality of the course, and here there are very strong parallels with the messages that emerge from looking at Sweden's workplace learning programs for students.

But it is not all one sided, for courses work best not only when employers are genuine rather symbolic partners in the educational process, but also when schools support and assist them in their role as co-educators. Courses work best when firms are well briefed on the content and purposes of the course, when the staff delivering the on-the-job training are briefed and trained for the task, when a clear and simply worded skills list is provided to guide the firm in developing a program of on the job training, and when there is regular liaison between school and firm to smooth the way and resolve problems. Naturally none of these are resource free, but schools have in many cases shown themselves willing to commit the necessary resources because they recognise the benefits for their students just as firms recognise the benefits for their staff. As in Sweden's experience, these are matters on which clear leadership by school principals will make a clear difference to student opportunities.

Creating effective learning opportunities for students through workplace learning programs is not just a matter of the industry horse pulling the educational cart. Schools are not simply passive agents in the face of external pressures for them to change. They, and the leadership that they can exert in their local communities, can make the real difference.

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